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Docket No.: 3691-0126PUS1  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
Kazuhiro CHIBA

Application No.: 10/566,727

Filed: February 2, 2006

For: METHODS AND DEVICES FOR  
SEPARATING SUBSTANCES USING  
COMPATIBLE MULTIPHASE SOLVENT  
SYSTEMS

Confirmation No.: Not Yet Assigned

Art Unit: N/A

Examiner: Not Yet Assigned

**LETTER**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Subsequent to the filing of the above-identified application on February 2, 2006, attached hereto is the International Preliminary Report on Patentability issued by the International Bureau on behalf of the International Searching Authority. Please make this document of record for the above-identified application.


Application No.: 10/566,727

Docket No.: 3691-0126PUS1

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or to credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Dated: June 8, 2006

Respectfully submitted,

By  #42,874  
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Attachments: PCT/IB/338, PCT/IB/373, PCT/ISA/237

## PATENT COOPERATION TREATY

PCT/JP2004/011407

From the INTERNATIONAL BUREAU

## PCT

NOTIFICATION OF TRANSMITTAL  
OF COPIES OF TRANSLATION  
OF THE INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY  
(CHAPTER I OR CHAPTER II  
OF THE PATENT COOPERATION TREATY)  
(PCT Rules 44bis.3(c) and 72.2)

To:

OHNO, Seiji  
Ohno & Partners  
Kasumigaseki Building 36F  
2-5, Kasumigaseki 3-chome  
Chiyoda-ku, Tokyo 1008036  
JAPON

Date of mailing (day/month/year)  
18 May 2006 (18.05.2006)

Applicant's or agent's file reference  
PNT-9006WO

International application No.  
PCT/JP2004/011407

International filing date (day/month/year)  
03 August 2004 (03.08.2004)

Applicant

TOKYO UNIVERSITY OF AGRICULTURE AND TECHNOLOGY TLO CO., LTD. et al

IMPORTANT NOTIFICATION

## 1. Transmittal of the translation to the applicant.



The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter I).



The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter II).

## 2. Transmittal of the copy of the translation to the designated or elected Offices.

The International Bureau notifies the applicant that copies of that translation have been transmitted to the following designated or elected Offices requiring such translation:

None

The following designated or elected Offices, having waived the requirement for such a transmittal at this time, will receive copies of that translation from the International Bureau only upon their request:

AE, AG, AL, AM, AP, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EA, EC, EE, EG, EP, ES, FI, GB, GD, GE, GH, GM, GR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OA, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

## 3. Reminder regarding translation into (one of) the official language(s) of the elected Office(s).

The applicant is reminded that, where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability (Chapter II).

It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned within the applicable time limit (Rule 74.1). See Volume II of the PCT Applicant's Guide for further details.

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Authorized officer

Yoshiko Kuwahara

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## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference PNT-9006WO	FOR FURTHER ACTION See item 4 below	
International application No. PCT/JP2004/011407	International filing date (day/month/year) 03 August 2004 (03.08.2004)	Priority date (day/month/year) 07 August 2003 (07.08.2003)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant TOKYO UNIVERSITY OF AGRICULTURE AND TECHNOLOGY TLO CO., LTD.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Box No. I | Basis of the report   |
| <input type="checkbox"/> Box No. II           | Priority  |
| <input type="checkbox"/> Box No. III          | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  |
| <input type="checkbox"/> Box No. IV           | Lack of unity of invention  |
| <input checked="" type="checkbox"/> Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> Box No. VI           | Certain documents cited   |
| <input type="checkbox"/> Box No. VII          | Certain defects in the international application  |
| <input type="checkbox"/> Box No. VIII         | Certain observations on the international application   |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis.2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. +41 22 740 14 35	Date of issuance of this report 08 May 2006 (08.05.2006)
	Authorized officer  Yoshiko Kuwahara  Telephone No. +41 22 338 90 90

## PATENT COOPERATION TREATY

TRANSLATION

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:

PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing  
(day/month/year)

Applicant's or agent's file reference

PNT-9006WO

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/JP2004/011407

International filing date (day/month/year)

03.08.2004

Priority date (day/month/year)

07.08.2003

International Patent Classification (IPC) or both national classification and IPC

Applicant

TOKYO UNIVERSITY OF AGRICULTURE AND TECHNOLOGY TLO CO., LTD.

## 1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability: citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

## 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

## 3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/IP

Authorized officer

Facsimile No.

Telephone No.

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2004/011407

Box No. I

Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
- a. type of material
- ☐ a sequence listing
- ☐ table(s) related to the sequence listing
- b. format of material
- ☐ in written format
- ☐ in computer readable form
- c. time of filing/furnishing
- ☐ contained in the international application as filed.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating hereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2004/011407

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability:  
citations and explanations supporting such statement

1. Statement

Novelty (N)

Claims 1-26

YES

Claims

NO

Inventive step (IS)

Claims 1-26

YES

Claims

NO

Industrial applicability (IA)

Claims 1-26

YES

Claims

NO

2. Citations and explanations:

Document 1 : JP, 1-108119, A (Sanki Eng. K.K.), 25 April, 1989 (25.04.89), claims, from 7<sup>th</sup> line from the bottom of the upper right hand side column of page 3 to 15<sup>th</sup> line of the upper right hand side column of page 4. (Family: none)

Document 2: JP, 3-30801, A (Shinnar REUEL), 8 February, 1991 (08.02.91).  
from 14<sup>th</sup> line from the bottom of the lower right hand side column of page 3 to 2<sup>nd</sup> line of the lower left hand side column of page 4.  
& US 4954260 A & EP 402120 A3

Document 3 : JP, 35-16460, B1 (TEXACO Development Corporation), 29 October, 1960 (29.10.60).  
from 17<sup>th</sup> line from the bottom of the left hand side column to 16<sup>th</sup> line from the bottom of the right hand side column of page 1. (Family: none)

The inventions disclosed in claims 1-26 appear to be novel or to involve an inventive step against documents cited in the ISR.

A technique for separating a target substance by using the first and the second solvents, the phases of which are reversibly changed from a state of being separated in two phases to a state of being mutually dissolved in one phase by changing their temperatures and keeping the upstream portion, the center portion and the downstream portion of a column within a given temperature range is not disclosed in any of the above documents, nor is obvious to a person skilled in the art.